FIG. 20.
of the ingot will in general be regarded as harmful, and often on this ground it is sought to hinder this in brands of hard steel by means of additions of aluminium or silicon.
In a special case, however, viz., in the production of soft ingot iron, which forms the main product of many open-hearth furnace works, this (evolution of gas on solidification) is able to be of considerable use, provided it does not exceed a certain limit. Soft metal properly manufactured, which has been deoxidised by means of manganese only, allows a portion of the gases to escape on solidification in a very regular manner, which, as always is the case, begins on the walls of the moulds, and proceeds in layers parallel to these.
The remainder of the metal remains so liquid that it admits of the passage of gases evolved, so that the solidified layers of metal retain no gas, and become quite sound. Only on the sound layer attaining a thickness of about 20 to 50 millimetres the metal in the interior of the ingot becomes viscous, thus causing some gas bubbles to be unable to escape through it to the atmosphere, and thus being retained in the metal. These group themselves quite regularly and form bubble zones parallel to the walls of the mould. The interior of the ingot, again, becomes quite sound and exhibits only odd irregularly-situated small blowholes. The fracture of such an ingot shows the class of appearance indicated in Fig. 20 herewith.
The total volume of blowholes require about the space which otherwise would have been taken up by the pipe ; whilst still the latter may appear to some extent in small detachments in the ingot in the neighbourhood of its axis over a large portion of its length, but at best causes the head of the ingot to be quite unusable, whilst these portions are sound. The faulty places are divided over, the entire ingot, in the form of small blowholes, which are filled with pure hydrogen and possess metallic surfaces. Therefore, the walls of the blowholes weld on being forced into contact by rolling or forging, or are actually made imperceptible. Thanks,
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